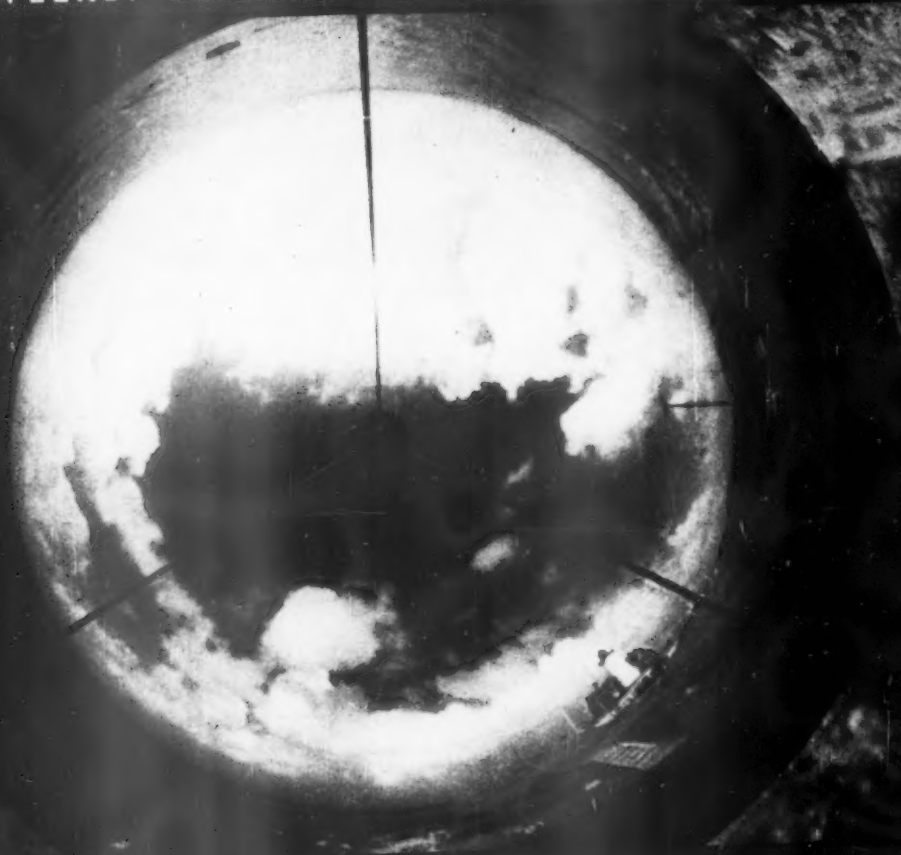


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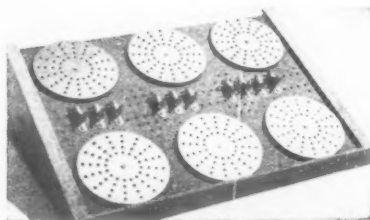
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



A SCIENCE SERVICE PUBLICATION

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AGRICULTURE

The Dust Bowl Again

The Dust Bowl presents a problem to our nation in times of drought. How to meet this problem if spring brings severe dust storms is discussed by a top conservation expert.

By HUGH HAMMOND BENNETT
Formerly Chief, Soil Conservation Service

► **PROLONGED** drought in the Great Plains is fast brewing ominous dust storms again. Thus far the storms have not grown to the proportions of the "black blizzards" of the nineteen thirties. Then a number of "dusters" reached the Atlantic coast. On May 12, 1934, a great "black duster" rolled across the country from the southern Plains to blot out the sun over the nation's capital and deposit Plains soil on the decks of ships hundreds of miles off the Atlantic coast. It was the first such experience since white man came to America. But others followed, during the thirties.

This time we have had no such dust storms; they have been more of a local nature. But what may happen with the return of the wind-erosion days of spring no one knows.

Frequently this current drought is referred to as the worst we have had. No, the one of the thirties was the worst, according to my experience. This time we have had no great trans-continental dusters; nor have we heard of crows building their nests of bits of wire picked up from barren farmsteads, in the absence of enough plant material for normal construction purposes.

But we gain nothing from such comparisons, except perhaps faith to go ahead with a sound program of anti-drought operations, which is the only effective way to curb wind erosion and dust storms.

Problem Is Complicated

Proposals appearing in the press are encouraging. At least we have a plan, parts of which are already in operation. The plans reported may sound complicated but the problem itself is highly complicated.

It may profit us to examine some aspects of our fight against the effects of drought during the first dustbowl period. That was a prolonged dusty and disastrous drought that extended across the Great Plains from Canada deep into Texas and adjacent New Mexico. The whole vast area was parched, including even the deep alluvial soils of river bottoms. At first Russian thistle, which has great tolerance for drought, was cut for hay, but finally that, too, succumbed to drought. At first, hay was shipped in but eventually trainloads of hungry cattle had to be shipped to remote pastures. Farmers by the hundreds gave up, abandoning their lands to move in waves of migration to distant states. And there was "dust pneumonia" and

numerous accidents along dust-dimmed roads.

Then the rains came and good crops of wheat and sorghum. The people forgot. They plowed up more virgin grassland along with much of what farmers had gradually reestablished with the assistance of soil conservation measures.

"Suitcase farmers" came in, leased land, tore down fences, plowed up everything and seeded wheat. Some of them made fortunes, repacked their suitcases, moved out and forgot their crimes against the public. But nature neither forgot nor forgave. Accordingly, we are being punished again for interference with the stern laws of nature.

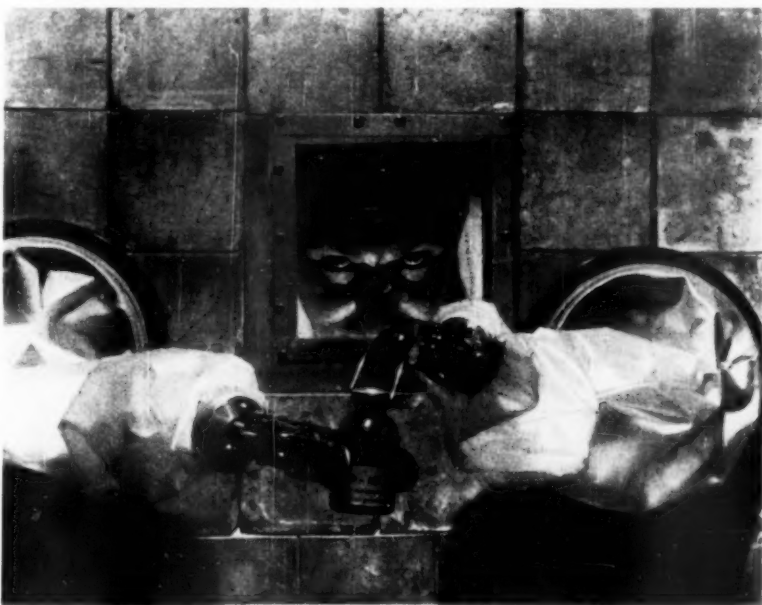
Not all has been forgotten—and that is what I want to point out. Experience sometimes provides valuable suggestions. I have reference to the experience of the Soil Conservation Service, whose birthday corresponded closely with the great dust storm of May 12, 1934.

The Soil Conservation Service ran head-on into the catastrophic drought of the 1930's and its attendant evils without com-

bat experience or proved implements of attack. Fortunately the Service was founded on the concept that soil erosion can be coped with only through the use and protection of land according to the needs and capability of the different kinds of land a farmer has, making use of those adaptable measures and combinations of measures required for sustained productivity of the soil.

New Measures Developed

Every proven measure was utilized and many new measures were quickly developed through trial and error. The old practice of listing was amended by contour application. Crop residues were carefully protected from overgrazing. Good results came from using wheatland for wheat, grassland for grass, and sorghum land for sorghum. We harvested seed of all the good grazing grasses of the region and planted them in contour furrows within their known range limits. Pasture areas were contour furrowed; even hole-digging machines were used on the contour on some of the more vulnerable lands. Wild sunflower—a weed—was planted in some of the more stubborn areas. Every implement and every planting were held to the contour. It probably was the world's greatest contouring movement, with the



ISOTOPES BOTTLED—Remote control is used to bottle atomic compounds "cooked" in British atomic furnaces and sent all over the world by air and ordinary mail. They are being used more and more in medical and biological research and industry.

exception of the practice of bench-terracing, which had its origin in ancient times.

Every measure mentioned in the press announcements and others were employed, except the Soil Bank.

The work proved successful where properly applied and maintained. To a considerable degree, wind erosion was stopped throughout the Great Plains.

Not all of this work has been forgotten. The Dalhart area in the Texas Panhandle is a notable exception. This was in one of the worst wind-whipped, drought-stricken areas in the whole afflicted region.

Finally the situation in this area was put under control. Even the dunes that had blown up were leveled and controlled with contour plantings of sorghums. And here the farmers had held on to their conservation practices; today these farms are in much better shape than those where the conservation practices were neglected or plowed up. The Dalhart area is a place where Plains farmers can go for conservation information and inspiration.

I mention these matters for whatever

they may be worth. They give me faith to predict a successful outcome of the new battle that apparently is to be fought to the finish, provided it is not made over-complicated and provided further that the farmers, the farmers' soil conservation districts, and those agencies which have had actual experience combating wind erosion along with other pertinent agencies be brought as fully as possible into cooperative action.

And, let's not forget that an element of mathematics is involved: We have a limited area of productive land, which is steadily being decreased by erosion, new buildings, new roads, and so on; we have, on the other hand, a rapidly increasing population. Let's not overlook the fact that these trends can clash with one another—will clash if left unattended.

So let's devote our efforts to solving the problems immediately in front of us. There is no time to waste on notions and unproved theories. We must move on the basis of land facts.

Science News Letter, January 19, 1957

AERONAUTICS

Aging Slowed in Space

► A SPACE SHIP traveler upon returning home from a long journey at high velocity would find that he had aged less than his earthbound twin.

This prediction of Einstein's theory of relativity has been verified experimentally, a United States scientist reports in a communication in *Nature* (Jan. 5).

To reach this conclusion, Dr. Frank S. Crawford Jr. of the University of California Radiation Laboratory combined the results of tests made by several scientists over a period of years.

He substituted the tiny sub-nuclear particles known as mesons for the brothers, since space travel is still for the future.

Some scientists, however, do not agree that Einstein's theory predicts the traveler would return physiologically younger than the stay-at-home. A controversy concerning this has been continuing for some time with strong words in the staid pages of *Nature*.

In order to guarantee Einstein's prediction that a pocket watch carried by a fast-moving space traveler will have performed fewer revolutions than the watch of his earthbound twin, Dr. Crawford says, three assumptions are sufficient. These are:

1. The time change of Einstein's theory of special relativity holds for uniform motion.

2. The acceleration of an ideal clock relative to an inertial framework has no influence on the clock's rate, and the increase in the proper time of the clock at any time is the same as that of the standard clocks in the framework in which the clock is momentarily at rest.

3. The traveler and his pocket watch are "good approximations" to an ideal clock, that is, the accelerations must not kill the traveler or break his watch.

Dr. Crawford sees a check of the first assumption in experiments that measured the lifetimes of mu mesons in flight, then predicted their lifetimes at rest, which value was later verified by tests.

The second assumption, Dr. Crawford reports, was verified by experiments in which the number of mu mesons decaying radioactively when at rest both at 11,500 feet and at 600 feet was counted. The counts were roughly as expected.

The scientists conducting the experiments cited by Dr. Crawford include Drs. Bruno B. Rossi, Norman Hilberry and J. Barton Hoag, Dr. F. Rasetti, Nobel Prize winner Dr. P. M. S. Blackett and Dr. H. Ticho.

Science News Letter, January 19, 1957

PUBLIC SAFETY

Misjudgment by Drivers Big Accident Cause

► DRIVERS misjudge and this is the major cause of accidents, a member of the Oregon State Highway Department told the Highway Research Board meeting in Washington.

A study of accidents on two-lane country highways with gravel shoulders in Oregon led researchers there to conclude that "accidents are essentially chance occurrences resulting from errors in judgment," David W. Schoppert of the Department said.

"The number of accidents," the Oregon survey showed, "increases with the number of situations presenting a change in conditions, and therefore requiring a decision on the part of the vehicle operator."

The study, made along 1,400 miles of highway in an attempt to find a means to predict accidents, also showed that on little

traveled highways, accidents are not related to the highway conditions such as width of lanes or wider shoulders. But, accidents increase when more cars are on the highway; the number of intersections and through driveways increases; sight distance is impaired and cross-section is reduced.

Mr. Schoppert also reported that the Oregon researchers have been able to formulate a series of equations which can be used accurately to predict the number of accidents on rural two-lane highways from road elements such as the average daily traffic, lane width and shoulder width.

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BIOCHEMISTRY

Smaller Virus Pieces Discovered Infectious

► SCIENCE has taken a step closer to possible understanding of the chemical basis of virus infection and mechanisms of heredity, as the result of work reported to the New York Academy of Sciences conference on viruses and nucleic acids by Dr. Heinz Fraenkel-Conrat of the University of California virus laboratory.

Dr. Fraenkel-Conrat discussed two recent results of his work.

One, he gets virus infection with nucleic acid (NA) about one-twelfth the size of the unit previously accepted as necessary for activity. NA contains all the capacity for virus infection and genetic transmission.

Two, new work in which fragments of NA cause infection provides further insight into internal virus structure.

Dr. Fraenkel-Conrat and Dr. Robley Williams over a year ago reported first recombination of two apparently inert virus components—rod-shaped NA core and protein coating. Later he showed NA active all the time, so this component never was inert.

Finding a smaller NA unit capable of activity gives better chance some day of understanding infection and the hereditary mechanisms caused by chemical structure. The molecular weight of the smaller unit is 200,000. This helps define minimum size of the active unit.

Proving fragments of viruses are active has brought important revision of the internal virus structure. In earlier experiments it appeared broken viruses lost infectivity. Recently, however, Dr. Fraenkel-Conrat showed fragments are infectious. Particles one-third to two-thirds full rod length are the most infectious of the fragments, though not as infectious as intact NA.

It was formerly assumed that NA molecules must be intact to infect, since broken viruses appeared unable to infect. It was also assumed all NA strands ran full length of the virus rod and were all broken when virus fragmented. It is now believed that some NA strands may be rolled up like string and overlap. This would explain how in fragments some NA strands remain intact and therefore infectious.

Dr. Fraenkel-Conrat also showed that addition of metal chelating compounds, such as pyrophosphate, increase the efficiency of reconstitution and can restore 30% to 40% of activity in contrast to only one percent in early experiments.

Science News Letter, January 19, 1957

A unique photographic machine that controls individual development of each negative on a long roll of film is now ready for use.

A new instrument to prevent thinning out of the water flowing over Niagara Falls can pick up a microscopic 1/50th of a foot change in the level of Lake Erie which feeds the Falls.

AGRICULTURE

Hunger to Cause Unrest

► THE MORE than 77,000,000 inhabitants of Russia's European satellites are going to be a lot hungrier this year than they were last year. And last year, although food consumption was not a famine diet, it was not satisfactory.

Poor harvests, mismanagement, a rapid buildup of cities and political unrest are all to blame, researchers at the U. S. Department of Agriculture said.

The poor food situation faced by the satellite peoples in Hungary, Poland, Czechoslovakia, East Germany, Rumania and Bulgaria spell more headaches for the Soviet Union. The Hungarian uprising will mean that other satellite nations will have to strain their larders to help out. This in turn will create further political unrest. A decrease in food supplies will mean an increase in discontent.

Here is how USDA's European Analysis Branch sees the future food situation in the Soviet Satellite area:

The 1956 grain harvest is down from last year.

Hungary faces a grim winter even if substantial relief is received. In addition, the rebellion in that country has disrupted the movement of supplies from surplus to deficit countries in the Red orbit.

If food consumption is to be maintained even at the unsatisfactory 1955-56 level, the

southern satellites and possibly the northern satellites will have to cut exports and/or increase imports.

Last year, the Government experts report, more or less pronounced shortages of meat, fats and dairy products plagued the urban consumer in all the satellites.

Rapid urbanization has been a cause of food shortages in Poland; in Czechoslovakia, per capita supplies in terms of calories were about the same as before the Second World War; the East German Government still maintains a far reaching rationing system; Hungary and Bulgaria had to import wheat; and Rumania, although blessed with a bountiful wheat harvest, had flour rationing, brought on by excessive exports.

The shortages, the experts agree, stem from a number of causes, notably: low level of supplies, inability to make the food distribution system work and rapid urbanization. At the root of the food supply problem, they say, is the failure of the satellite nations to expand their output, which is still below the prewar average. In addition, agriculture has been hampered by the Red emphasis on heavy industry, a problem that plagues even Mother Russia.

Finally, the USDA observers report, satellite farming has suffered from a number of unfavorable growing seasons since 1950.

Science News Letter, January 19, 1957

GENERAL SCIENCE

Water Shortage Problem

➤ MAN himself is mostly to blame for the water shortage problems he now faces in the Southwest.

Man, in all innocence, moved into the Southwest and upset the natural balance. H. G. Thomasson told the U. S. Geological Society of Washington in Washington, D. C.

As a result he now is plagued with a ground water shortage.

Some of the problems created by upsetting the balance are being faced now, Mr. Thomasson said, but still others will have to be faced in the future. Whether or not the Southwest can be saved from a slow death by water starvation can not now be predicted, the hydraulic engineer stated.

There are still avenues open to water experts, trying to find a means to quench the thirst of the parched Southwest, Mr. Thomasson reported.

One, currently being attempted, is moving large quantities of surplus water from areas rich in water to areas in need. On the grandest scale, this is what is happening with water-rich northern California to water-poor southern California. But this is a long term problem, Mr. Thomasson cautioned, and highly complicated. It involves storage and transportation difficulties, which are magnified in the California situation, where the northern country is subject

to long, unpredictable dry spells. This is characteristic of the entire Southwest.

Storage itself may prove to be one of the keys to bolstering the nation's dwindling water supply, Mr. Thomasson said.

There is, he stated, the hope that a means can be found for man to replace much of the water that he uses. An optimistic project, now drawing the attention of water experts, is the utilization of underground reservoirs. At present, Mr. Thomasson reported, above ground space for reservoirs is almost as short as water to fill them.

Underground storage space seems unlimited, Mr. Thomasson stated. Water could be stored in much the same manner that it is held behind dams. In some areas in the country underground reservoirs, which once held water, have been pumped out and could possibly be turned from a natural reservoir into a man-usable reservoir.

By using underground reservoirs, Mr. Thomasson pointed out, water could be stored during wet years and withdrawn during dry years. But, here again, there are many complications and it cannot be done overnight. However, Mr. Thomasson said, "we should be hearing more and more about underground water storage and see its use in the foreseeable future."

Science News Letter, January 19, 1957

MEDICINE

Treatment for Sclerosis

➤ TREATING multiple sclerosis cases with fatty acids extracted from the spinal cords of beef cattle appears to stop new attacks of the disease, Drs. R. L. Noble, K. K. Carroll and A. S. Douglas, London, Ontario, reported in the *Canadian Medical Association Journal* (Jan.).

The scientists warn that their experiments are only preliminary and that no conclusions have been drawn from them. They do believe, however, that the results warrant further investigation at treatment centers where large numbers of multiple sclerosis patients are available.

Multiple sclerosis may be caused by a nutritional deficiency of certain unsaturated fatty acids in the body, the researchers believe. When these are not present, there may be a breakdown in the maintenance and functioning of the myelin nerve sheath, a fatlike substance around nerves that keeps them from short circuiting, much like rubber insulation protects electric wires.

From the spinal cords of cattle, the scientists have extracted a yellowish oil composed of long chain fatty acids believed to take part in myelin formation. Six drops of this tasteless oil are taken daily by ten multiple sclerosis patients who are being treated with it. Treatment of the first case

began in May, 1955, and the last within the past six months.

Since then, the patients have had no other treatment, except for "symptomatic therapy," and none have shown signs of any new nerve lesions.

There has been no spectacular improvement observed, the scientists reported, but this is to be expected if the nutritional deficiency theory is correct. Only a prevention of increased severity would be expected, they said.

"All that can be said about these patients at the present time is that during the period that they have received F.A.F. (fatty acid fraction), none of them has experienced a major exacerbation (increase) of the process," they reported.

Science News Letter, January 19, 1957

MEDICINE

Best TB Drug Shown by Radioactive Tracing

➤ TWO of modern medicine's most powerful anti-tuberculosis drugs have been made radioactive to show how they are absorbed in the body.

Scientists at the University of Chicago re-

port that the two drugs, PAS (para-aminosalicylic acid) and isoniazid, were labeled with radioactive carbon 14 and traced throughout the bodies of infected animals to determine which one did the best job of destroying TB germs.

Isoniazid, generally considered to be the best anti-TB drug now in use, was found to be retained in tubercular lesions while the other drug, PAS, penetrated the lesions but left them just as quickly, the researchers reported.

Infected tissues such as spleen and lung seemed to store up the available isoniazid. The more infected the tissue, the greater was this storing up. The distribution of the PAS drug, on the other hand, was not affected.

Drs. Alfred Heller, Dieter Koch-Weser and Lloyd J. Roth, University of Chicago, and Dr. Robert H. Ebert, now at Western Reserve University, Cleveland, Ohio, reported on the research in the *American Review of Tuberculosis and Pulmonary Diseases* (Jan.).

Science News Letter, January 19, 1957

AGRICULTURE

Pigs Found to Stand Up To Jet Plane Noise

➤ PIGS appear to hold up better under the strain of screaming jet airplanes than do their owners.

Farmers are worried, the U. S. Department of Agriculture reports, that prolonged noise from jet aircraft will affect their livestock. To allay the farmers' fears and find out just how and to what extent jet noise bothers farm animals, USDA is currently running a series of experiments with noise and pigs.

In preliminary studies, meat-type hogs show no ill effects from being penned up with a record machine that blares "flyovers" by both jets and conventional propeller-driven planes.

The animals listen to the noise from 6 a.m. to 6 p.m. at predetermined irregular intervals that range from a few seconds to 12 minutes. Some of the pigs, the USDA scientists said, were born right into the jet-noise pen.

Maximum intensity of sound one mile from a jet airfield, the scientists have determined, is about 120 decibels. This is approximately 20 to 25 decibels more than the intensity beside a large farm tractor.

Although the hogs show no outward or inward signs of adverse effect to date, researchers eventually hope to find if prolonged jet noise causes a drop in egg, meat or milk production, or a change in feeding habits. They also hope to discover whether or not a tolerance for the noise develops with a life-long exposure to it.

Pigs are being used first because they grow rapidly and have shorter life-cycles than larger farm animals. The work is being conducted by C. F. Winchester, James Bond, L. E. Campbell, J. G. Hartsock and J. C. Webb at USDA's Agricultural Research Center, Beltsville, Md.

Science News Letter, January 19, 1957

ASTRONOMY

Origin of Solar System

Objects accumulated in a dust cloud very early in the solar system's history played an important part in the formation of the planetary system and possibly the sun, theorizes Dr. Urey.

► A NEW THEORY for the origin of the solar system is proposed by the Nobel Prize winner, Dr. Harold C. Urey of the University of Chicago.

It accounts, Dr. Urey reports, for some characteristics of meteorites, including the diamonds found in them, and for the varying densities of the planets.

His theory is that objects about the size of asteroids or the moon accumulated in a dust cloud very early in the solar system's history, or about 4,500,000,000 years ago. These solid objects played an important part in the formation of the planetary system and possibly of the sun, Dr. Urey believes.

After clumping together, the solid objects were then heated to temperatures sufficiently high to melt silicates and iron, 1,500 degrees centigrade. Dr. Urey suggests that either chemical heating by free radical reactions or heating by the fall of objects through gases could produce the necessary high temperatures.

After some period of time, millions or tens of millions of years, during which the objects cooled to about 500 degrees centigrade, they fell rapidly toward a gravitation center. It was then that the sun was formed, with a gigantic disk composed of leftover gas and these solid objects.

During this process, melting of the iron and silicates that are the chief materials of meteorites could also have occurred.

These primary objects were then broken up by intense collisions that reduced the solid material to fragments varying from too small to be visible up to the size of meteorites, Dr. Urey proposes.

The gas and dust in the giant solar disk were dissipated by solar light pressure and turbulent gases, and some of the solid material was removed by spiraling toward the sun.

It was during this time, about 4,300,000,000 years ago Dr. Urey believes, that the planets and asteroids accumulated.

During the process of breakup and re-accumulation, separation of the silicates and metals occurred in varying degrees. This variable loss accounts for the different densities of the planets, Dr. Urey reports in the *Astrophysical Journal* (Nov., 1956).

Fragments resulting from the later breakup of the reaccumulated objects are the meteorites. The primary, or first-formed, solid objects must have clumped together before the formation of the solar system, Dr. Urey believes, in order to account for the known properties of meteorites.

He suggests that protoplanets, or planets in the making, in the sense of large masses of gas and dust of the same composition as the sun did not occur, or at least they did

not occur until after the separation of the metals and silicates in the primary solid objects.

Dr. Urey proposes that the moons circling the earth and other planets were formed by a similar process.

Science News Letter, January 19, 1957

ASTRONOMY

Two Generations of Stars Found in Orion Nebula

► A "FATHER" star that sired more than 100 stars in a brief but very intense "lifetime" is the source of one of the brightest regions in the sky, the Orion Nebula.

The first star lived and died within 1-800,000 years, which is a relatively short time on the astronomical time scale. When it burned out, it left behind a dense compressed shell of neutral hydrogen within which a second generation of stars were formed.

This life history of the Orion Nebula is drawn by Dr. Malcolm P. Savedoff of the University of Rochester, Rochester, N. Y. He believes the Orion region was a shapeless cloud of neutral hydrogen until about 2,000,000 years ago. Then the initial star, so bright it was completely burned out some 200,000 years ago, appeared.

Around the primary star was formed an ionized hydrogen region in which the gas pressure was several hundred times that in the neutral cloud. The ionized gas expanded into interstellar space, squeezing the material there to produce a compressed region of neutral hydrogen in which the 100 very bright and hot stars were formed nearly simultaneously.

"In the second generation," Dr. Savedoff reports, "the Orion Nebula is the brightest emission nebula in the sky." Therefore, he concludes, in the *Astrophysical Journal* (Nov., 1956), "it should be the most ephemeral."

The constellation of Orion is visible high in the southern sky during the evening in January. The Great Nebula in Orion is marked by the middle star of the three in line in Orion's sword. Through the telescope it appears as a luminous greenish cloud.

Dr. Savedoff bases his theory on the observed mass, radius and expansion rate of the great arc in the Orion Nebula that appears as an elliptical ring, which is also the source of radio waves.

The shell surrounding the Orion Nebula has an observed velocity of about six miles per second and a mass five times that of the sun.

Science News Letter, January 19, 1957



FOR "CENSUS" OF NEUTRONS—
The antenna shown with Prof. Serge A. Korff will be used on Guam by two New York University physicists in counting neutrons produced by cosmic rays. They hope to find, among other things, a new scientific check for the measurement of historic time.

AGRICULTURE

Device Shocks Seeds Into Germination

► SHOCK-TREATMENT APPARATUS may soon be a standard piece of American farm equipment. With it, farmers will be able to improve germination, dry grain, process food and kill weed seeds.

The key to these future farm possibilities with shock treatment is a small electrical device invented by O. A. Brown of the U. S. Department of Agriculture's experiment station, Knoxville, Tenn. It is a low-frequency electrical energy machine that is simple in design and operation and inexpensive.

Experimentally, a working model of the device has successfully speeded up corn seed germination, helped prepare soybean seeds for dehydrated processing and inhibited the germination of other seeds.

The device consists of a glass tube, horizontally mounted, and fitted with electrical terminals at each end. The tube has two mouths on top. One, corked in operation, is the entrance for the seeds. The other is connected to a vacuum pump.

Seeds put into the tube are subjected to radiation from the glow discharge of the low-frequency current at less than atmospheric pressure. The device gives greater control than previously possible. Mr. Brown was aided in developing it by associates at the station.

Science News Letter, January 19, 1957

MEDICINE

Cancer Cells Make Measles Virus Harmless

► THE VIRUS that causes measles can be made harmless by growing it in cancer cells, Drs. Francis L. Black, Magdalena Reissig and Joseph L. Melnick of Yale University School of Medicine have discovered.

The measles virus was added to rapidly growing human cancer cells in laboratory test tubes, and the scientists later harvested 1,000,000 times the amount of virus they had put in.

The virus underwent a drastic change while being grown in its new environment, the scientists reported, and lost its ability to cause sickness.

When the cancer-grown measles virus was tested on monkeys known to be susceptible to measles, none of the animals became ill, even though the virus could be found in their blood.

When the virus was withdrawn from the monkeys and put back into the cancer cells, the researchers found that still another change had taken place. The virus had lost much of its ability to infect. It took 30 to 56 days to infect the cancer cells, instead of the two days needed before.

Whether these findings will lead to a good measles vaccine is still unknown. Future research may disclose whether or not the cancer-grown type of virus can create immunity against the disease-producing type, in much the same way that cowpox vaccine helps to immunize against smallpox.

The research work of Drs. Black, Reissig and Melnick was supported by the American Cancer Society and the National Institutes of Health.

Science News Letter, January 19, 1957

BIOCHEMISTRY

Live Virus May Give Life Polio Immunity

► LIVE polio virus is now being fed to a group of children who have previously received Salk vaccine injections.

It is hoped that this new procedure of giving live but weakened virus, in gelatin capsules or in milk, after Salk shots may offer lifelong immunity against paralytic polio, Dr. John R. Paul, Yale University School of Medicine, New Haven, Conn., reported in New York to a conference on cellular biology, nucleic acids and viruses at the New York Academy of Sciences.

The virus being used is a weakened strain of Type 1 polio virus, the type responsible for the great majority of paralytic cases.

The major practical question about the presently used Salk vaccine is whether or not it will give as long lasting immunity as Dr. Salk believes, Dr. Paul reported.

If not, Dr. Paul questions whether it is best to supplement the Salk vaccine with revaccination every so often, or just to "depend upon natural 'alimentary' infections

or reinfections in a vaccinated child to keep his or her immunity automatically in repair . . ."

These natural infections have been found to stimulate the production of polio-fighting antibodies in children who have already received the Salk vaccine and thus give a "durable" immunity, Dr. Paul reported.

But this may be leaving things up to chance, he said, whereas a planned program of oral vaccination in Salk vaccinees with live but weakened virus "theoretically would eliminate pure chance in the production of a more complete and lasting immunity — an important point."

In an earlier series of tests, 13 persons received varying doses of live virus after being immunized by the Salk vaccine, Dr. Paul reported.

"At no time did illness occur nor was there any spread of the infection to eight close associates living in the same hospital ward," the scientist said.

Co-authors of the report with Dr. Paul were Drs. Dorothy Horstmann and Joseph Melnick, Yale University School of Medicine, Dr. Joyce Deutsch, Southbury, Conn., and Dr. James Niederman, New Haven, Conn.

Science News Letter, January 19, 1957

GEODESY

Survey Celebrates 150th Birthday

► THE COAST and Geodetic Survey, whose findings and charts are used by millions of people in everyday life, celebrates its 150th anniversary on Feb. 10 this year.

To mark its continuous growth since the administration of Thomas Jefferson, Secretary of Commerce Sinclair Weeks has announced a series of public events. The sesquicentennial program will be under the direction of Admiral H. Arnold Karo, director of the Coast and Geodetic Survey.

Plans include issuance of a special commemorative postage stamp, special publications and demonstrations of the many ways the agency is performing services essential to public safety, commerce, defense and science.

The Survey was founded in 1807 to chart the bays and harbors of the United States, then later it was sent inland. Now it has drawn in from coast to coast the imaginary lines on which the position of every citizen's back fence depends.

With polite regrets, the Survey answers letters from small boys asking for charts of sunken treasure.

Although the meaning of the Coast part of the Survey's name is clear, the Geodetic part puzzles many. Geodesy is the kind of surveying that takes into consideration the size and shape of the earth, and checks its calculations by the fixed stars. The local surveyor, who deals in straight lines, has to have a point to start from. These points, called plane coordinates, are fixed by the Coast and Geodetic Survey.

Science News Letter, January 19, 1957

IN SCIENCE

GENERAL SCIENCE

Endowed Professorship Honors Enrico Fermi

► AN ENDOWED professorship at the University of Chicago will be set up to honor the "father" of the atomic age, the late Enrico Fermi, the president of Bell Telephone Laboratories, Dr. M. J. Kelly, announced.

A Nobel Prize winner, Dr. Fermi is best known as the first man to achieve the controlled release of nuclear energy in a chain reaction. However, his other contributions to modern physics would have earned him a high place as a scientific leader.

The professorship, to be established at the University's Institute of Nuclear Studies where Dr. Fermi was both teaching and conducting research at the time of his death in 1954, is designed to perpetuate and memorialize Dr. Fermi's many scientific contributions.

Dr. Kelly will serve as chairman of a national committee to establish the professorship. Serving with him will be Walker L. Cisl, president of Detroit Edison Company, Dr. Crawford H. Greenewalt, president of Du Pont Company, and Admiral Lewis Strauss, chairman of the Atomic Energy Commission.

The Honorable Clare Boothe Luce, former United States ambassador to Italy, and His Excellency Dr. Manlio Brosio, Italian ambassador to the U. S., are honorary committee members. An advisory subcommittee will be formed.

Science News Letter, January 19, 1957

AERONAUTICS

Detector Protects Planes From Crash Fires

► A NEW detecting system to protect all airplanes from crash fires has been devised by two scientists at the Lewis Flight Propulsion Laboratory in Cleveland, Ohio.

It acts immediately and automatically and is so constructed that accidental operation is improbable. Only damaged areas where fire breaks out are put out of commission, leaving the rest of the airplane for normal operation.

Drs. Jacob C. Moser and Dugald O. Black who developed the method report it can be used on all airplanes, whether they are powered by reciprocating, turboprop or turbojet engines. The system is based on the use of mechanically simple switches that detect linear movement of vulnerable parts or contact pressure.

It was developed after a study of full-scale experimental and accidental airplane crashes.

Science News Letter, January 19, 1957

THE FIELDS

BIOLOGY

Big Horns Roam Again in North Dakota Badlands

► EIGHTEEN BIGHORN SHEEP, obtained from the British Columbia Game Commission, were released in the Badlands of North Dakota in an attempt to re-establish these big game animals in the Badlands.

A 200-acre pasture was fenced off on federal land in the rough country west of Grassy Butte, in McKenzie County. The new home of the bighorns is located in some of the most rugged country in the state, directly west of Grassy Butte, deep in the badlands of the Little Missouri River.

Bighorn sheep were native to the Badlands of North Dakota before the turn of the century. They were hunted by early settlers, trappers and explorers. However, they completely disappeared, along with the grizzly bear and buffalo. State biologists expect the introduction of these 18 sheep to be the nucleus of a future herd of bighorns in North Dakota. They will be kept inside the huge pasture for at least one year, to keep a close watch over their progress.

Science News Letter, January 19, 1957

MEDICINE

Law Regulating Filters Urged

► CIGARETTE FILTERS sooner or later must be standardized by law, and manufacturers required to state how effective each filter is in removing the tobacco tars suspected of causing cancer, Dr. E. L. Wynder, Sloan-Kettering Institute, New York, contends in a leading article in the *British Medical Journal* (Jan. 5).

The "supposed health protection" smokers get from filtered cigarettes is based on large advertising claims and other factors, the scientist said.

With present filters, removing "specific components" from a particulate phase of the smoke does not seem possible. Therefore, to be effective at all, the filters must allow only a minimum amount of smoke to pass, Dr. Wynder states. This minimum amount would still give a satisfactory pressure drop and tobacco taste but would remove a large percentage of the cancer-inducing tars.

"Present work indicates that it is entirely possible to develop a filtered cigarette with a good pressure drop and satisfactory tobacco taste which will remove about 40% of nicotine and tar from a given cigarette. Uniform acceptance of a filter in this range will be a partial answer to the present problem, provided, of course, that the smoker does not decide to smoke twice as many cigarettes," Dr. Wynder reports.

Aside from filtration, Dr. Wynder sug-

gests two other practical methods that might help solve the problem.

One is the control of the burning process inside the cigarette itself, since this burning plays an important part in the formation of some of the cancer-causing agents. Ways might be found to stop this reaction from taking place and present studies of such things as oxygen supply used, temperatures reached, and the cut of the tobacco leaf may give new clues about the burning process, Dr. Wynder states.

Another possible method of control may be removing the hydrocarbons that occur naturally in tobacco.

If these hydrocarbons "represent one of the main precursors of tobacco-tar carcinogens," a reduction of the hydrocarbons may reduce the cancer-causing agents, the scientist reported. It may become practical, Dr. Wynder reports, to remove some of these substances from the tobacco by washing it with chemical solvents, a method that is now being tried.

Science News Letter, January 19, 1957

VETERINARY MEDICINE

Tranquilizers Make Pets Easier to Handle

► EVEN MAN'S best friend, the dog, is getting tranquilizing drugs these days.

The next time you take Fido to the vets, he may go willingly if you follow the treatment prescribed by Dr. Jack O. Knowles, a Miami, Fla., veterinarian.

When dogs are scheduled to come in for treatment, Dr. Knowles has their owners give them tranquilizer pills an hour beforehand. The drugs, Miltown or Equanil, usually take effect by appointment time and then snarling, snapping canines become as docile as lambs.

The drugs are also good for car sickness and other minor conditions such as fear of thunder and lightning, and for keeping the four-footed patients from becoming too fretful while being penned up at the vet's, Dr. Knowles reports.

Other more powerful tranquilizers are used for dangerous dogs or when an "unusual amount of cooperation" is needed, such as in X-ray therapy. Their big advantage is that they can be injected on the spot and take effect within 15 minutes.

Hard-to-handle pets are usually held by their owners until they get a shot in the hip muscle and then everything is rosy.

Owners are as happy with the new therapy as the pets are, the veterinarian says, since the drugs usually make the dogs more quiet and peaceful when taken home. They also reduce the animals' tendency to molest stitches and bandages.

"These are useful drugs," Dr. Knowles states. "They are quite safe," he added, "even when tested with several doses per day over a period of time much longer than most veterinarians would wish to use them."

Dr. Knowles reports on his use of the tranquilizers in the *Journal of the American Veterinary Medical Association* (Jan. 1).

Science News Letter, January 19, 1957

PUBLIC SAFETY

Man-Made Resins Stop Skidding on Highways

► MAN-MADE resins show "great promise" as surface coatings for highways, and they can be used to prevent skidding at toll booth entrances, the Highway Research Board was told at its annual meeting in Washington.

The chemicals, a by-product of the oil industry, are known as epoxy resins. They have some of the same properties as natural resins plus certain special qualities such as hardness, flexibility and resistance to chemicals.

Epoxy resins, C. V. Wittenwyler and T. G. Nock of the Shell Chemical Corporation reported at the meeting, have been tested as a road surfacing material on a heavily-traveled highway near New York since 1954.

Results so far, they said, indicate the coating has "great promise for use in critical areas."

The entrance to a toll booth on Connecticut's Wilbur Cross Parkway has been coated with epoxy resins, Warren M. Creamer of the Connecticut State Highway Department and R. E. Brown of Shell Chemical Corporation reported to the meeting.

Heavy traffic volume, they said, had caused an excessive amount of wear, resulting in a dangerously slippery area where cars must continuously stop and start. The epoxy resins, when mixed with tiny stones and applied to the surface, have prevented skidding and are protecting the concrete apron around the toll booths from further deterioration.

Science News Letter, January 19, 1957

BIOCHEMISTRY

Two More Major Polio Viruses Crystallized

► ALL three of the major polio virus strains have now been crystallized and purified, Dr. Carlton E. Schwerdt of the University of California virus laboratory reported to the conference of the New York Academy of Sciences in New York.

The work is important in understanding and fighting infections. Dr. Schwerdt told how he had determined the physical properties of the Mahoney and Usaukett strains of polio virus. Similar work on the MEF-1 strain was requested by him in the fall of 1955.

The physical properties of all three strains are similar. All are nucleoproteins of ribonucleic acid type. Chemical studies, limited so far to the Mahoney and MEF-1 strains, suggest detectable chemical differences between the strains of the different types.

Further work, also supported by the National Foundation for Infantile Paralysis and with collaboration of Dr. Frederick L. Schaffer, is in progress to determine the differences.

Science News Letter, January 19, 1957

ENGINEERING

Submarine Liners

Future travel may include a trip abroad on a submarine. Subs, which are not affected by elements, foreseen as transoceanic carriers for men and material.

By **HOWARD SIMONS**

► **THAT TRIP ABROAD** sometime in the future may be taken aboard a submarine, that is, if you do not mind missing a chance to sit in a deck chair.

A fond hope of submarine builders from the earliest days of undersea craft, shipment by sub of both passengers and goods has become more and more a possibility in the minds of several transportation experts. Nuclear power, gas turbine engines and bleach are beginning to add up to a means for shipping that may be speedier than some surface boats and surer than air traffic.

Probably the best argument for using submarines peacefully has been voiced by Sir George Puget Thomson, a Nobel Prize winner and professor at Cambridge University, England. Sir George thinks man ought to try to copy the fishes.

Subs Produce Few Waves

A submarine deep beneath the surface of the water, he says, produces practically no waves, as does its upstairs counterpart, the surface vessel. If properly designed, "its resistance need be very little more than 'skin friction,'" he reports. Add this to the fact that an atomic powered submarine can probably travel along at 70 to 80 knots an hour with considerably less horsepower per ton than an Atlantic liner and the prospects seem promising.

"The economic speed for carrying goods," Sir George says, "is a matter of delicate balance. Increased speed requires more power, that is more expensive engines and more nuclear fuel, though this will be a minor cost. On the other hand, a fast vessel can make more trips in a year, or in a month, and so earn more. A short transit-time saves interest on the value of a cargo, and for certain cargoes early delivery may be important. It also reduces the cost of wages for the trip."

Sir George cautions in his submarine transport thinking, contained in his book, "The Foreseeable Future," that whether passengers would prefer the greater comfort of a large undersea liner to the greater speed of an airplane is "a question of psychology."

What makes the submarine as a mover of man and material so interesting during peacetime is the fact that it is rarely, if ever, affected by the weather. Unlike surface ships and airplanes, a submarine could adhere to a very tight schedule, mindless of typhoons, storm warnings, snow, icebergs

and the other hazards of transoceanic travel.

A war-minded development, the atomic submarine, has opened the way to peaceful uses for it. The Nautilus, the U. S. Navy's first atomic-powered undersea vessel, has already proved its metal. It has stayed below the surface longer than any other submarine. It has traveled farther underwater than any other submarine. It has traveled faster than any other submarine. And it has proven to be safe for its crew members, who are well protected against the lethal radiation of nuclear fuel.

For the Navy, the Nautilus and the Sea Wolf are just the beginning. Three more atomic subs are already under construction. Fifteen are planned, including what may well be the world's largest. Seven of the planned subs, Rear Adm. Herman Rickover, mentor of atomic submarines, says, will be faster than the Nautilus. The last of the 15, he reports, will have two atomic reactors and will displace 5,000 tons.

For transport planners this is only the beginning, too. Designers are already busily wedding the atomic engine to the gas turbine. This would, in effect, be a marriage

between the engine of the future and the fuel of the future.

Dr. J. J. McMullen, chief of the office of ship construction and repair of the U. S. Maritime Administration, has said, "gas turbines now appear to be the ideal power take-off for the nuclear reactor and they seem to be married to each other, the atomic reactor supplying fuel and the gas turbine supplying mechanical power."

As a small power package, many experts think this combination would be ideal for submarine utilization.

Hydrogen Peroxide as Fuel

Another interesting development in submarine propulsion is the fact that scientists both here and in England are experimenting with hydrogen peroxide, most commonly thought of as bleach for blondes.

Britain's latest experimental undersea craft, the Explorer, for example, is powered by hydrogen peroxide. It is thought to be the first stable ocean-going vessel to use bleach as a fuel. The Germans have been credited with building five peroxide-powered subs, during World War II, but never got around to using them.

A big advantage in using peroxide, the British have found, is that no bubbles escape to reach the surface as tell-tale markers. Aboard the Explorer, the peroxide propul-



ATOMIC-POWERED SUBMARINE—The Nautilus, The U. S. Navy's first atomic-powered submarine, may be a forerunner of civilian subs, designed to carry tourists and cargo underwater to ports of call. As the weather is no problem to the submarines, they would always leave on time.

sion system, coupled with a conventional diesel, is used for added bursts of speed.

At Massachusetts Institute of Technology, scientists, sponsored by the U. S. Navy, have found peroxide to be potentially useful as a propellant for submarines, torpedoes, rockets, and assisted take-offs for aircraft.

Submarines, now thought to hold great potential as a peaceful means of communication and transportation, have most often been associated with the world's navies and warfare. Historically, credit for building the first submarine goes to a Dutch inventor, Cornelius van Drebel, who in 1620, built a vessel which is said to have navigated the Thames River in England at a depth of from 12 to 15 feet. Propulsion of van Drebel's undersea vessel was provided by 12 rowers, a far cry from nuclear and peroxide power of today.

Van Drebel's sub, as well as many of the others built before the American Revolution, were designed and used experimentally for peaceful uses. Not until 1776 was a submarine used for war purposes and it was an American undersea raider called the "Turtle." Designed by David Bushnell, the "Turtle" unsuccessfully tried to blow up an English ship anchored off New York.

But man's earlier submarine dreams were for a new means of travel and transport, and now it appears that the dream may become a reality.

At the rate undersea travel is being speeded up and refined by scientists the world over, it may not be too far in the future when the average citizen boards a submarine at dockside, hears the familiar "all ashore that's going ashore," takes his von boyage basket and goes down a conning tower to begin his trip across the ocean. Atomic-powered passenger submarines are just below the horizon.

Science News Letter, January 19, 1957

ASTRONOMY

Report Recovery of Returning Comet

► A COMET that returns to the sun's vicinity about every five years has been spotted by the Japanese astronomer Tomita of Tokyo Observatory, Harvard College Observatory reports. Known as Grigg-Skjellerup Comet, its magnitude is 14, too faint to be seen without a large telescope.

Science News Letter, January 19, 1957

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● RADIO

Saturday, Jan. 26, 1957, 1:45-2:00 p.m., EST
"Adventures in Science" with Watson Davis, Director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Max A. Woodbury, research professor of mathematics, New York University College of Engineering, New York, N. Y., will discuss "Engineering Use of Mathematics."

BIOPHYSICS

Government Looking for Old and Full Tin Cans

► WANTED: unopened tin cans of food 11 or more years old. Needed by the U. S. Food and Drug Administration. The can you saved may save your life.

This could be the advertisement for a survey now being conducted by the Food and Drug Administration to determine how much radioactivity gets into the staple foods we eat.

A nationwide search for authentic samples of canned foods packed prior to 1945 is the first step in the survey, FDA Commissioner George P. Larrick has announced.

The year 1945, Commissioner Larrick explained, is regarded as the "year one" of the atomic age and such foods will be of particular value in determining the base for future radiation measurements.

In addition to collecting pre-1945 samples, the FDA is also collecting samples of recently packed products for comparison. The objective of the program is to determine the naturally occurring "background radioactivity" in foods from different areas of the country, Commissioner Larrick said.

These foods will then be monitored for any changes in radioactivity which might be caused by weapons testing or other applications of atomic energy.

The FDA Commissioner stated emphatically that there is no evidence to date of any significant radioactivity in the nation's food supply.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE CHILD WHO IS MENTALLY RETARDED—Children's Bureau—*Gott, Printing Office*, Children's Bureau Folder No. 43, 1956, 23 p., illus., paper, 10 cents. Information and advice for parents on what to do for the retarded child.

DOCUMENTATION IN ACTION—Jesse H. Shera, Allen Kent and James W. Perry, Eds.—*Reinhold*, 471 p., illus., \$10.00. Based on a conference on documentation at Western Reserve University and discussing the techniques of effectively organizing and utilizing recorded information.

EDUCATION AND HUMAN MOTIVATION—H. Harty Giles—*Philosophical Library*, 108 p., \$4.00. Presenting an integrative theory of human growth and behavior and describing research designed to test and improve the theory.

ELEMENTS OF PARTIAL DIFFERENTIAL EQUATIONS—Lin N. Sneddon—*McGraw-Hill*, International Series in Pure and Applied Mathematics, 427 p., \$7.50. Presenting the elements of the theory in a form suitable for the use of students and research workers whose main interest lies in finding solutions of particular equations rather than in the general theory.

ENCYCLOPEDIA OF CHEMICAL REACTIONS: Volume VI, Samarium, Scandium, Selenium, Silicon, Silver, Sodium—Compiled by C. A. Jacobson and edited by Clifford A. Hampel—*Reinhold*, 438 p., \$12.50. A reference work for chemists.

FISHES: A Guide to Fresh- and Salt-Water Species—Herbert S. Zim and Hurst H. Shoemaker—*Simon and Schuster*, A Golden Nature Guide, 160 p., illus., paper, \$1.00. To help you to identify the fish you catch on a fishing trip or see in an aquarium.

HEREDITY AND YOUR LIFE: An Account of Everyday Human Inheritance—A. M. Winchester—*Vantage*, 333 p., illus., \$5.00. Telling the facts, superstitions and misconceptions about human heredity.

IBM JOURNAL OF RESEARCH AND DEVELOPMENT: Vol. 1, No. 1—C. B. MacKenzie, Ed.—*International Business Machines Corporation*, 100 p., illus., paper, quarterly, \$5.50 per year. Publishing comprehensive articles on the latest scientific and technical results from IBM research and development laboratories here and abroad.

INTRODUCTORY ELECTRICAL ENGINEERING—George F. Corcoran and Henry R. Reed—*Wiley*, 527 p., illus., \$7.95. A text designed for use in an introductory course in electrical engineering. A complete revision of the senior author's "Basic Electrical Engineering."

LIFE AND MIND—Edmund Ware Sinnott—*Antioch Press*, Antioch College Founders Day Lecture, 29 p., paper, 50 cents. Because man himself is a living thing, the author points out, some of the deepest problems in philosophy are ultimately bound to be biological ones.

MANUAL OF RECLAIMED RUBBER—J. M. Ball, Ed.—*Rubber Reclaimers Association*, 94 p., paper, \$3.00. Technical data concerning this important aspect of the rubber industry.

NEW PERSPECTIVES FOR RESEARCH ON JUVENILE DELINQUENCY: A Report of a Conference on the Relevance and Interrelations of Certain Concepts from Sociology and Psychiatry for Delinquency, held May 6 and 7, 1955—Helen L. Witmer and Ruth Kohnsky, Eds.—*Gott, Printing Office*, Children's Bureau Publication Number 356, 1956, 92 p., paper, 30 cents.

PHOTOGRAPHS OF THE YEAR, 1957: The Annual Review of the World's Photographic Art, Sixty-Second Year of Issue—Introduction by A. L. M. Sowerby—Philosophical Library, 31 p., illus., \$6.95. Photographs of the highest quality with a plate-by-plate commentary by R. H. Mason. Prints and comments will interest photographers, but the pictures will delight anyone who loves the beauty with which we are surrounded.

PHYSICAL TECHNIQUES IN BIOLOGICAL RESEARCH: Volume II, Physical Chemical Techniques—Gerald Oster and Arthur W. Pollister, Eds.—*Academic*, 502 p., illus., \$12.80. Directed to researchers in biology and describing a large number of physical techniques that might prove useful to them in advancing their investigations.

PHYSICS—John Stewart Marshall and Elton Roy Founder—*Macmillan*, 906 p., illus., \$8.50. A text for the first and second years of a university course. Calculus is not needed for an understanding.

SOLID STATE PHYSICS: Advances in Research and Applications, Volume 3—Frederick Seitz and David Turnbull, Eds.—*Academic*, 588 p., illus., \$12.00. Providing students and researchers with surveys of important areas in the field.

THEORY OF LAND LOCOMOTION: The Mechanics of Vehicle Mobility—M. G. Bekker—*University of Michigan Press*, 520 p., illus., \$12.50. Providing automotive engineers with a comprehensive source of information on the physical relationship between a motor vehicle and the environment in which it operates, particularly in off-the-road locomotion. Skis, sleighs and toboggans are included.

Science News Letter, January 19, 1957

PUBLIC HEALTH

Army Vaccine Cuts Illness to a Sniffle

► A VACCINE that was 98% effective in preventing widespread respiratory diseases like the common cold among Army recruits was described at a conference on cellular biology, nucleic acids and viruses.

The new vaccine was designed to combat

respiratory diseases caused by organisms known as adenoviruses, types four and seven. These viruses cause diseases that resemble the common cold, but are accompanied by fever and inflamed membranes in the nose and throat.

The vaccine was reported by Dr. M. R. Hilleman, Walter Reed Army Institution of Research in Washington.

At Fort Dix alone, this type of illness had cost \$1,500,000 a year in hospital care and lost man hours, Dr. Hilleman reported. During the winter of 1954, roughly 80% of all recruits at Fort Dix had become infected with the adenoviruses during their first eight weeks in the Army.

"The vaccine," Dr. Hilleman said, "is prepared by treating, with a solution of formaldehyde, viruses which have been grown in cultures of monkey kidney tissue. The method closely parallels that used in manufacturing the Salk polio vaccine."

With the help of the new vaccine, expected to become generally available in the "not distant future," the total number of respiratory diseases was reduced by 81%.

These adenovirus infections are not widespread among adults in civilian life, Dr. Hilleman reported, and cautioned that the public should avoid "foisting upon itself needless vaccinations in its grasping at any straw which offers hope for relief for its proverbial running nose."

He told the conference, sponsored by the New York Academy of Sciences, that the "potential need for the vaccine in children seems much greater than in adults."

Science News Letter, January 19, 1957

BIOCHEMISTRY

Harmless Bacteria Made Dangerous

► A "TRANSFORMING CHEMICAL" that can make harmless bacteria change into virulent or disease-producing bacteria has been separated from virulent bacteria by Drs. Deana T. Klein and Richard M. Klein of Columbia University and the New York Botanical Garden, New York.

The transforming chemical is DNA, or deoxyribonucleic acid, which, along with protein, makes up some viruses and the genes of cells. These genes carry hereditary factors from one generation to another.

The scientists worked with both the virulent and non-virulent strains of a bacterium called *Agrobacterium tumefaciens*. Only the virulent strain produces tumorous growths in certain plants, but when the DNA extracted from this strain was added to the normally harmless non-virulent strain, it too was able to cause plant tumors.

The harmless bacteria take up the DNA chemical and add it to one or several clusters of their own genes, the researchers reported. Then, this added DNA becomes a permanent part of the once-harmless genes, and the genes become disease-producing ones.

The research was supported by the American Cancer Society.

Science News Letter, January 19, 1957

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By H. T. Sohrman, M.D., and O. L. Levin, M.D.

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Encouraging Science Talent . . .



THE NATIONAL SCIENCE YOUTH PROGRAM

The Science Service National Science Youth program, dedicated to the development of science talent among youth, in operation since 1941, is effective, widespread and resultful in acquainting youth with science and technology.

About 400,000 boys and girls in junior and senior secondary schools participate in 16,000 science clubs affiliated, at no cost, with Science Clubs of America, sponsored by Science Service. With the basic material furnished, these groups conduct, inspire and encourage science experiment and experience predominantly through the six golden years of high school education.

There are each March or April, science fairs organized through encouragement and distribution of "know-how" by Science Service. Science fairs are being held in 1957 in about 160 areas in the nation. Some 200,000 youth annually show their science and technology exhibits and projects. As top awards, contestants in these local fairs are sent to the National Science Fair, conducted by Science Service in a different city each May. Approximately 300 students will attend the Eighth National Science Fair in Los Angeles, May 9-11, 1957.

Science fairs are conducted by local organizations that enlist participation of school systems, colleges, industries, newspapers, service clubs, museums, etc. This is a "grass-roots" operation which reaches youth with directness. Good teachers espouse and encourage it. All the science factors in a community can cooperate. The hope

is that there will be a science fair available to every interested student. Now, well over a half of the nation is covered geographically. State academies of science and other science groups are taking leadership in the movement, cooperating with Science Service.

The annual Science Talent Search for the Westinghouse Science Scholarships, conducted by Science Service, the 16th of which is now in progress, selects from all the high school seniors of continental United States, those whose scientific skill, talent and ability indicate a potential creative originality.

The Science Talent Search is the pioneering demonstration that successful scientists of the future can be spotted at the high school level. Studies of 40 winners and 260 honorable mentions chosen each year show that they fulfill magnificently their expectations, more than half going on to doctoral degrees. Entrants in 32 states have the opportunity of further recognition in state searches.

Experimental kits (THINGS of science, etc.), magazines (SCIENCE NEWS LETTER and CHEMISTRY), services to newspapers, radio programs, etc., are Science Service activities that support and implement the science youth program.

Additional participation in this national science youth program, at national and local levels, will augment the future supply of scientists and engineers.

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OCEANOGRAPHY

Whole Sky Pictured
Using Special Camera

See Front Cover

► A SPECIAL CAMERA that photographs the entire sky, the horizon and the sea or land surface to 30 degrees below the horizon reflected in a spherical mirror has been developed by Dr. William S. von Arx of the Woods Hole Oceanographic Institution, Woods Hole, Mass.

A still view taken with the camera is shown in the photograph on the cover of this week's SCIENCE NEWS LETTER. Besides the entire sky, the Light House on Nobska Point, Woods Hole, Mass., and the waters of Vineyard Sound and Woods Hole harbor on both sides of the point are visible.

The reflecting field compressor is a parabolic mirror 16 inches in diameter, mounted with vertex upward. The camera is a modified K-100, 16 mm time-lapse camera, triggered automatically at sunrise to expose one frame each minute until sunset, when it switches off automatically.

The photographic weather station, installed on the bridge of the Institution's R. V. Crawford, uses about 100 feet of film per week. Also photographed simultaneously with the state of the sky and the sea are instruments recording the temperature and humidity of the air, barometric pressure, time and the ship's heading. From these records, scientists can determine the cloudiness of the sky, the state of the sea, then correlate this information with other scientific data.

Recent research work with the instrument was performed under contract with the U. S. Weather Bureau and the Office of Naval Research for the National Hurricane Research Program.

Science News Letter, January 19, 1957

AGRICULTURE

Curtains for Brooders
Halve Operating Costs

► PUTTING SIDE CURTAINS on chick brooders heated by infrared light cuts operating costs in half, scientists at the U.S. Department of Agriculture and at Purdue University Agricultural Experiment Station have found.

The saving is about two cents a chick, John G. Taylor and Ernest A. Johnson, who conducted the experiments at Lafayette, Ind., reported.

No great differences in gains and feed-efficiencies between chicks reared in brooders with and without curtains were found in tests during the normal 11-week brooding period. However, brooders without side curtains used almost 93% more electrical energy than those with curtains.

White vinyl plastic, clear vinyl plastic and aluminum sheeting, they found, were equally effective in reducing operating costs.

Science News Letter, January 19, 1957

Questions

AGRICULTURE—In the drought of the 30's with what did birds build their nests? p. 35.

☐ ☐ ☐

ENGINEERING—What is the new fuel being used in submarines? p. 42.

☐ ☐ ☐

GENERAL SCIENCE—What is one advantage of underground storage of water for use during "water short" years? p. 38.

☐ ☐ ☐

MEDICINE—From what are the fatty acids used in treating multiple sclerosis extracted? p. 38.

How can the measles virus be made harmless? p. 40.

☐ ☐ ☐

PUBLIC SAFETY—What class of compounds is being used to prevent skidding on highways? p. 41.

☐ ☐ ☐

PHOTOGRAPHS: Cover, Woods Hole Oceanographic Institution; p. 35, British Information Services; p. 37, All American Engineering Company; p. 39, New York University; p. 42, U. S. Navy; p. 48, Eastman Chemical Products, Inc.

ASTRONOMY

Find No Natural Satellite In Space Around Earth

► WHEN MAN FLINGS the first artificial satellite into space later this year, the chances are high the tiny sphere will not compete with any natural earth satellites farther out in space than it is.

Three years of an intensive search of much of the space around earth by Clyde

W. Tombaugh, discovered of the solar system's most distant planet, Pluto, show it is empty of relatively large material from 1,600 to 22,200 miles above the earth's surface. The space from 300 miles out to 1,600 miles is now being scanned for possible natural earth satellites from a site in Ecuador.

The first major phase of the work, supported by the Army's Office of Ordnance Research in Durham, N. C., was conducted at Lowell Observatory, Flagstaff, Ariz.

The equipment used by Mr. Tombaugh was so sensitive it could detect a clean white tennis ball only half illuminated to the observer at 1,000 miles above the earth's surface, or record a dark meteorite about one foot in diameter at the same height.

Mr. Tombaugh reported that his search disclosed a few "suspects," most of which were later found not to be natural satellites. Those not yet eliminated are being checked again from Ecuador.

The basic principle of Mr. Tombaugh's technique is the use of a Schmidt or other fast camera of wide field, moved at a rate to conform with the angular speed the supposed satellite would have across the sky. If a satellite actually existed, its image on the photographic film would be concentrated in a point image or dot, or a short trail.

The techniques he developed are expected to have definite significance in making observations of man-made satellites, which the United States and probably Russia are planning to launch in connection with the International Geophysical Year starting next July 1.

A determination that the space near the earth is free of debris up to a certain size would also be useful to long-range missile experts and to proponents of space travel.

Mr. Tombaugh's report notes that the surface of the moon may provide "grim evidence" of scars produced by collisions with matter flying about in space. Whether these scars were produced by asteroids or left-over debris from some process involved in the birth of the moon, or by some other method, is not known.

The earth has probably suffered from a comparable number of hits in the past, but vigorous action of water erosion has erased most of the evidence. On the moon, there is no appreciable erosion and thousands of craters, whose origin is still not settled, are easily seen with small telescopes.

Science News Letter, January 19, 1957

PALEONTOLOGY

Its Hoots Long Stilled, Fossil Owl Gets Name

► SOME long dead owl bones have been named and identified as a new fossil species closely related to the Barn Owl.

Dr. Loye Holmes Miller, emeritus professor of biology at the University of California at Los Angeles, has proposed as the scientific name of the bird, *Lechusa sturtoni*.

The fossilized bones of Sturton's Owl were among a collection of bone fragments

discovered by Joseph Arndt in a Pliocene-age formation in San Diego, thought to represent a shallow-water marine accumulation on tidal sand bars that serve as a resting ground for marine birds. The owl probably roosted in a nearby cliff.

Dr. Miller gives his reasons in the *Proceedings of the California Academy of Sciences* (No. 26, 1956) for choosing the name, *Lechusa sturtoni*.

"In northern Mexico and Arizona the name *Lechusa* (Latin-American spelling) is applied to the Barn Owl in distinction from the eared owls that are called *tecolote*. I have therefore chosen a generic name from the Spanish instead of the Greek." The specific name honors his colleague in paleontology, Dr. R. A. Sturton.

Science News Letter, January 19, 1957

Do You Know?

The *sponge*, a relatively simple animal, has the ability to reassemble itself if broken into tiny pieces.

A new type *face shield* has been developed for use by troops or others required to work in extremely cold climates.

Next to the cereal crops, the *potato* is of major importance in Colombia and is grown widely at altitudes from 4,500 feet to almost 12,000 feet.

About one-third of world *wheat* exports for 1955-56 were made by the United States.

Connoisseurs claim the finest *pate de foie gras*, the goose liver delicacy, comes from Strasbourg in Alsace.

Chromite from low-grade domestic deposits, such as those in Oregon and Montana, can be treated to yield satisfactory alloying material for steelmaking.

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Science News Letter, January 19, 1957

✿ **NON-SKID PAPER** is a form of heavy duty cross-creped material made from kraft paper. The paper stretches and can be lengthened 60% of its base length and 45% of its base width at the same time. The material can be printed, die-cut, slit or sewn.

Science News Letter, January 19, 1957

✿ **"DRY BOX"** gloves for workers in atomic energy plants and nuclear research laboratories are made of neoprene. The gloves have curved fingers. Made with extra long sleeves, the gloves are available in a 27-inch length with a five-inch inside diameter opening, and in 30-, 32- and 36-inch lengths with an eight-inch opening.

Science News Letter, January 19, 1957

✿ **FISHERMAN'S SHOT DISPENSER** permits anglers to apply shot to their lines in less than a minute. The device, which is shown in the photograph, holds a supply



of 3/0 split-shot. A single shot is dialed into position in a feeder slot, the line is inserted in the slot, a plunger pressed, and the job is done. The automatic dispenser is molded of a butyrate plastic.

Science News Letter, January 19, 1957

✿ **HEATED STEERING WHEEL** for cold weather driving of either automobiles

or tractors is a British invention. The heating element can be made to be attached to the wheel rim and will keep a driver's hands warm in below-freezing temperatures.

Science News Letter, January 19, 1957

✿ **GYM BAR** for the home can be attached to a doorframe without screws, nails, suction cups or tools. Made of 18 gauge stainless steel tubing, the gym bar weighs less than three pounds. It will fit any doorway from 25 to 38 inches wide.

Science News Letter, January 19, 1957

✿ **GLASS SLICER** is a cutting tool that consists of a spring base with a slotted guide board. When the cutter is run down the slot, the glass slices or separates at a slight bend of the base. The board guides the cutter along a straight line while the base holds the glass at the needed pressure points.

Science News Letter, January 19, 1957

✿ **PORTABLE CARRIER** to hold luggage, groceries and/or sport equipment is designed to fit on any conventional rear trunk lid of an automobile. Made of steel with a chrome finish, the adjustable carrier measures 36 by 38 by 7½ inches and holds up to 250 pounds of distributed weight.

Science News Letter, January 19, 1957



Nature Ramblings



By HORACE LOFTIN

"THE MELANCHOLY DAYS are come, the saddest of the year, Of wailing winds, and naked woods, and meadows brown and sear."

Thus William Cullen Bryant described the bleakness of northern winter as it affects the majority of plant and animal life. But this melancholy time is not a time of death: it is a time of sleep and rest for nature buried under winter's snow.

Look at the "naked woods." Each twig contains a winter bud, dormant but ready to burst into green life with the first warm days of spring. The brown, sear meadows, too, are full of sleeping seeds which will sprout to cover the meadows in green once more when winter is gone.

Buried in the ground, under leaves and in decaying limbs are countless numbers of lesser life: worms, insects, snails. These will emerge from winter sleep soon. Those

The Winter Sleep



species that perished with the onset of winter surely left their autumn eggs warm and safe, to carry on the cycle of life another year.

Some of the mammals, such as the deer, must struggle against cold and lack of food till spring returns. But many mammals are wrapped in a profound sleep, hidden in a warm burrow or cave. The ground squirrels, woodchucks, and jumping mice are especially deep hibernators

where winter is most severe. Skunks, raccoons, badgers and opossums sleep for several weeks at the time, although they may rouse and forage for food when mild weather sets in.

Bears are deep sleepers in winter, but their sleep cannot be called true hibernation. Throughout the winter, their body temperatures remain close to normal. Among true hibernators, body temperature falls to a very low level, barely enough to maintain life.

Other body changes occur in those mammals which are true hibernators. In the ground squirrel, for example, the heart may beat some 100-200 times per minute after the animal awakes from hibernation. But in his winter sleep, the tiny mammal's heart beats only five times a minute. Likewise, the normal ground squirrel breathes about 187 times a minute. In hibernation, this may fall to only four a minute!

Science News Letter, January 19, 1957